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TEACHING STRATEGIES

Teaching strategies are the procedures, processes, activities, and tools used to assist in learning. These strategies encompass a wide range of approaches and

actions and are situated across a variety of contexts. Instructors and teachers use teaching strategies to enhance learning from preschool through college settings. Many other professionals and laypersons use teaching strategies, from parents teaching a child how to ride a bike, to physicians teaching interns about medicine, to mechanics teaching apprentices how to repair a car.

There is a wide range of teaching strategies available to those involved in helping others learn. The type of teaching strategy used will vary according to the students' characteristics; the learning task; the situation; the context demands; and the knowledge and skills of the "teacher," whether that person is a parent, professor, or mechanic. Most effective teachers and instructors will use a variety of teaching strategies, after carefully considering all of the factors that affect instruction.

In the following sections, a brief history of the development of teaching strategies is provided, as well as a description of a variety of teaching strategies, including instructor- and student-centered options. New developments in technology and teaching are also discussed.

Historical Contributions to Teaching Strategies

Interest in effective teaching strategies has been a focus of discussion and research for hundreds of years. Perhaps one of the earliest teaching strategies was described by Plato in *Socratic Dialogues*. Plato described what has come to be known as the *Socratic method* of teaching, which is a variant of a strategy used by Socrates. Still used today as a teaching strategy, the Socratic method is a dialectic method of teaching that involves dialogue and questioning, emphasizing the exchange of ideas and suppositions that then transforms knowledge itself.

Many significant contributions to our knowledge of teaching strategies have been made in the past two centuries, continuing today with exciting new developments (e.g., brain research). John Dewey was an American psychologist, philosopher, and educator whose contributions to the field of education continue to be evident today in many teaching approaches. Although he wrote extensively on many different topics (e.g., democracy, human conduct, logic), his contributions to the field of education focused on teaching approaches. Dewey felt that content area

subjects should be integrated when taught and that experiential education—learning by doing—was the most effective way to teach. He also believed that teachers should emphasize critical thinking as opposed to memorizing facts, and that problem solving and inquiry were two concepts that should be embedded in instruction.

Ivan Pavlov's work in the 1920s and the research of Edward Thorndike and B. F. Skinner have also had a profound effect on the development of teaching strategies. Pavlov studied stimuli and responses in an effort to understand learning and is famous for discovering *classical conditioning* involving involuntary responses. Thorndike and Skinner expanded Pavlov's research by examining learned (voluntary) behaviors and were major contributors to the research on operant conditioning. They examined the antecedents and consequences of behavior. Thorndike discovered that any behavior is more likely to be repeated if it results in a positive outcome (the law of effect). Skinner studied the antecedents of behavior, the behavior itself, and the consequences of behavior and is generally viewed to be the founder of behavior modification. These researchers contributed to the foundation of teaching strategies based on the principles of behaviorism.

Jean Piaget and Lev Vygotsky contributed to the development of teaching strategies based on cognitive and social interaction learning theories. After studying how children learn, Piaget theorized that humans go through four stages of cognitive development: sensorimotor, preoperational, concrete operational, and formal operational. How one thinks becomes more sophisticated at each stage, and therefore, Piaget posited that teaching strategies would need to be adapted to each stage. Although Piaget found that social transmission (learning from others) was an important aspect of learning, he did not focus on language and communication as the primary vehicle for learning.

As Vygotsky examined learning, he theorized that not only were social interactions a key to learning, they created learning. His research on language, culture, and cognitive development was a significant contribution to the sociocultural theory of learning. Vygotsky felt that through interactions with those around them, children co-construct knowledge. One key element in the group co-construction of knowledge is having less capable students work with more capable students or adults. The more capable person (e.g., teacher) can enhance the less capable students' learning by providing scaffolding; that is, support during the learning task.

Scaffolding is a common term in teaching and learning and refers to visual and verbal prompts and supports that facilitate learning. Many constructivist teaching strategies and approaches to teaching are based on Piaget's and Vygotsky's ideas and theories.

Building on the social-cognitive theories of learning, Albert Bandura, a Ukrainian-Canadian psychologist, developed the social learning theory. His research revealed the power of modeling as a tool for learning. Bandura found that learning occurs from observing others and from being reinforced for learning successes. His research also focused on self-efficacy, or the belief that one has about one's ability to perform satisfactorily. These beliefs affect the learner's perception of a task, as well as the motivation to attempt a task.

Jerome Bruner, an American psychologist, focused on how students understood the conceptual underpinnings of knowledge. He was interested in how to structure instruction so that conceptual understanding was achieved. Whereas Piaget felt that learning was determined by what stage one occupied, Bruner's research concluded that learning was not dependent on one's stage (or age), but on environmental and experiential factors. Therefore, the way in which instruction was organized and what was emphasized during instruction were keys to improving learning. Inquiry and discovery learning teaching strategies grew out of Bruner's work on using inductive reasoning to improve students' deep understanding of concepts and structures of knowledge.

Research has also focused on how concepts and ideas are taught, as opposed to how the learner discovers or constructs knowledge. Whereas Bruner focused on inductive reasoning as a path to learning, David Ausubel, an American psychologist, focused on deductive reasoning to enhance learning. Ausubel's research resulted in the development of more direct teaching strategies. Expository teaching strategies that emphasize using verbal information to help learners understand concepts, particularly the use of advance organizers, have grown from Ausubel's studies. Advance organizers are tools used by instructors to help learners organize new and existing information. Constructed and presented before students are expected to learn new concepts, they provide an external scaffold upon which students can develop internal schemas to classify and construct knowledge.

Another educational researcher who focused on the organization and delivery of instruction, Siegfried

Engelmann, investigated methods of teaching that would enhance the learning of students challenged by poverty and educational barriers. Engelmann developed approaches to instruction not based on Piaget's idea of stages or on the discovery learning ideas of Bruner but rather on how to set up learning experiences so that all students are actively involved, they are given many opportunities to respond, and during which teachers continually assess student performance and provide feedback. After conducting several large-scale research projects, Engelmann developed the direct instruction method of teaching based on effective instructional components including homogeneous small group instruction, carefully designed instruction, active responding, and frequent feedback and correction.

From this very brief overview of the historical foundations of teaching strategies, several themes emerge. There are differences in the ways learning is perceived, from those that focus on stages of development to those that focus on the interactions between the learner and the type of instruction. These differences are reflected in the diversity of teaching strategies used today.

Examples of Effective Teaching Strategies

Most teaching strategies have emerged from the research done on learning. The logic is that if learning occurs under certain circumstances, such as in a group dialogue or from observing, then teaching strategies should match those circumstances. As a result, teaching strategies have been classified according to a wide range of criteria. Student-centered, inquiry-oriented, constructivist, direct instruction, and cognitive are some of the categories used to describe teaching strategies, all of which emanate from philosophical and/or research-based perspectives on learning and teaching. This discussion includes two broad categories of teaching strategies: instructor-centered and student-centered. In instructor-centered teaching strategies, the instructor takes an active and engaged role throughout the teaching process. Of course, all instructors are most effective when they are actively engaged regardless of the teaching strategy being used. However, a key distinction between instructor- and student-centered strategies is the direct and continual involvement of the instructor *throughout* the learning process in instructor-centered strategies. In the category of student-centered teaching strategies, the instructor may take on the role of

observer, guide, facilitator, or even mediator during the learning process, leaving aspects of the learning to occur within and among the students. Student-centered teaching strategies involve similar planning and preparation efforts on the part of the instructor, but less direction and control during the learning process.

Instructor-Centered Teaching Strategies

Expository Teaching Strategies

Expository teaching strategies involve the instructor verbally leading and engaging students in the learning process. These strategies include the traditional lecture method or smaller, mini-lectures/presentations. In the traditional lecture teaching strategy, certain elements are associated with positive learning outcomes: gaining attention and generating anticipation, presenting the objective of the lesson/lecture, stimulating background knowledge and review of previously addressed material, verbal explanation of the concepts or ideas, providing examples that lead to learning, providing practice opportunities and feedback, assessing the learning, and summarizing.

When using expository teaching strategies, the instructor must first gain the learners' attention and generate interest in the topic. Many techniques can be used to achieve this, such as posing a problem of interest or asking a provocative question—both of which should be of interest to the audience and related to the topic. Concrete or visual items can be presented, such as a model, an example, or a picture to stimulate interest. Next, the instructor provides the objective for the lesson so that students can understand the ultimate purpose of the lesson and also follow a mental route to that end. The instructor then connects that objective or topic to previously learned material and/or to the students' background knowledge.

During the verbal explanation of the topic, the instructor can, of course, talk. But most instructors recognize the power of using additional strategies at this point. For example, visual aids such as graphic organizers, semantic maps, charts, curriculum webs, graphs, video clips, pictures, and diagrams all enhance the learning process. A clear sequence that flows from concept to concept, reconnecting previously discussed ideas and continually offering examples and clarifications, enhances learning. The instructor then offers practice opportunities for students, such as writing exercises, lab experiments, math problems, questions, or case study examples. Practice opportunities can range from 1-minute writes, to short

questions posed for limited discussions among peers, to more complex and involved practice items that may or may not be accomplished in one lesson. Students can be assigned to or form self-chosen groups to accomplish the practice. During practice, the instructor provides feedback and error correction. If a concept is very new to students, then the instructor offers more frequent feedback and correction. During practice, the instructor should be assessing students' understanding. Assessment can also be accomplished through a question-and-response period led by the instructor or by evaluating the outcomes of the practice activities. At the conclusion of the expository lesson, the instructor summarizes by restating the lesson objective and reviewing the concepts addressed.

Mini-lessons/presentations are structured in the same manner as standard exposition. The difference is that the verbal explanation (i.e., the actual lecturing) comprises only a small proportion of the lesson and the student practice time is extended. Mini-lessons work well with younger students and those with attention difficulties, or when a longer lecture is just not possible due to time constraints.

Interactive-Expository Teaching Strategies

Similar to expository teaching strategies, the interactive-expository strategies are sequenced in the same manner, but additional elements such as interactive questioning (e.g., using the Socratic method), modeling, and high levels of student responding are embedded in the lesson. The Socratic method as it is used today can best be described as a discussion in which the leader (teacher) poses questions to students, and then responds to student input with additional questions designed to facilitate student engagement and active knowledge construction. Like Socratic methods, most interactive-expository strategies contain elements that resemble more of an interactive dialogue with the students than a traditional lecture. The instructor uses student responses and input during the lesson to adjust the pace and content of the exposition. Students are encouraged to participate in the dialogue by discussing topics with their peers, writing responses (e.g., the 1-minute write), posing questions, completing graphic organizers, constructing semantic maps, or paraphrasing content presented. In "instructional conversations," the instructor builds understanding among the students by mediating student dialogue so that the students are actually co-constructing their knowledge and understanding

through the conversations. The instructor poses questions, elaborates on students' comments, and redirects students' input to achieve the learning outcomes.

Modeling

Modeling is a powerful teaching strategy that can take many forms and be embedded into any learning experience. However, modeling a task (e.g., measuring volume), a procedure (e.g., making a chemical solution), or the production of an ideal product (a research paper) should contain verbal explanations that clarify and enhance learning. The verbal explanations do not require a lecture per se, but can be short explanations of what the instructor is doing and why, while emphasizing the expected outcome. Some refer to these short explanations as "think alouds." For example, a science teacher might model an entire scientific procedure from start to finish as he or she verbally explains his or her thinking, purpose, and expected outcome. An English teacher may model the process of writing a paper, starting with the outline, while explaining his or her thinking to the students. After modeling the process, the instructor may show an example of the product—a well-written paper—at which time the instructor points out the critical attributes of a quality product.

Modeling may be used to show students parts of a task, with student practice following each modeling session. If a task is complex and in-depth, and the students have little background knowledge, often the instructor will model components of the task, have students attempt that component, and then, based on how the students performed, either move on to the next modeling session or repeat the first modeling session.

Direct Instruction

Direct instruction teaching strategies include homogeneous small group instruction, high rates of student responses, frequent feedback from the instructor and error correction, brisk pacing, sequenced lessons, and instructor scaffolding. Small groups that consist of students working at the same level in a given area, such as word decoding, algebraic understanding, reading comprehension, or grammatical skills, are identified through assessment and formed for instruction. It should be noted that these are not long-standing groups, such as the traditional ability groups. These types of small, similar-skill-level groups will change as students become more proficient. Students may master concepts and move to different instructional groups at different rates.

In direct instruction, the lessons are sequenced carefully so that new skills and concepts are introduced only after students have mastered the prerequisite knowledge or skills. Students continue to practice mastered skills but are confronted with only a limited number of new concepts in each lesson. They are provided with carefully constructed examples and nonexamples of the concept or skill. While working with the small groups, the instructor follows a routine that includes research-proven effective teaching behaviors. The instructor continually asks for student responses during the lesson and assesses student understanding and mastery through those responses, providing feedback, practice, and error correction after each response. The pace of the lessons is brisk, but not hurried. Although the intensity of the lessons is high, with many student-teacher interactions, the lessons are not long. The idea is to intensively teach a skill or concept during the lessons and follow with student practice on those specific skills. Student practice occurs immediately following the lesson, with the teacher providing continuing feedback on students' performance. The students are also given extended practice, such as homework focused on skills that they have mastered.

Student-Centered Teaching Strategies

Although instructors will not be directly involved in all aspects of learning when using student-centered teaching strategies, they must plan extensively for these strategies to be successful. Instructor involvement may range from being a close guide throughout an activity, to an observer noting what students are discussing, how they are progressing, and if the learning objective is being accomplished. Many student-centered teaching strategies have developed from a constructivist view of learning that emphasizes co-construction of knowledge through students' verbal and experiential interactions.

Peer Learning Groups

Many instructors use student groups as a teaching strategy. These groups can take a variety of different forms, from homogeneous to heterogeneous, and be used for a wide range of learning objectives. Homogeneous groups can be skills-based with students at similar skill levels (e.g., all understand two-digit addition, but not two-digit subtraction) that are grouped together for instruction. Homogeneous groups can also be interest based (e.g., all students with an interest in nonfiction

books). Heterogeneous groups comprise students with dissimilar characteristics or interests (e.g., students ranging from first-grade to sixth-grade reading abilities grouped together or students with different interests in science in one group).

Skills groupings are homogeneous groups formed by assessing students' skill levels in specific content (i.e., reading) or depth of understanding of a particular subject (i.e., chemical reactions). Students are identified and assigned to groups based on those similarities. The tasks performed within these groups are designed to match the students' specific capabilities. Skills grouping is a teaching strategy that can be used with struggling as well as with highly capable students.

Interest groupings can be formed based on students' similar interests so that students can pursue a deeper understanding in an area of interest (e.g., marine animals, cars, astronauts). Although students may be at different skill levels in these groups, their homogeneous interests would allow them to work together on projects or assignments.

Perhaps the most popular heterogeneous grouping technique used as a teaching strategy today is the cooperative learning group. These groups are heterogeneous because the goal in the formation of the groups is to have a wide diversity of knowledge and skill levels represented. Setting up successful cooperative learning groups and tasks involves very specific techniques. The instructor must set up the learning task so that there is positive interdependence; that is, to achieve the learning outcome, all members of the group are dependent on each performing his or her assigned task or role. If an individual's task is not completed or a role is not fulfilled, that will affect the entire group's accomplishment. The roles and tasks can be assigned according to each member's abilities and skills. For example, if one member is unskilled at writing, that member may be the person who collects the needed information, but is not required to write.

Another aspect of effective cooperative learning is individual accountability, in which each member is not only accountable for a job or task, but also is accountable to the entire group. Group feedback forms on how each member contributed to the group project is one way to promote accountability. Cooperative learning group tasks are structured so that the process includes face-to-face interaction. If the task is set up so that students divide the jobs, individually complete the jobs, and then reconstitute the group, then the task is not designed for cooperative learning.

Student reflection and goal setting should also be an integral part of a cooperative learning task.

There are many different types of cooperative learning techniques, from "numbered heads together" to "jigsaw" techniques. Research has shown that cooperative learning groups improve understanding and achievement in all content areas; improve social interactions and social skills; and promote inclusion of a diverse set of abilities, interests, and perspectives.

Peer tutoring groups, another heterogeneous grouping strategy, involves matching more capable students with those who are less capable in a given area or skill. Peer tutoring groups can range from one-on-one tutorials to small groups in which a more capable student may teach three or four students who demonstrate lower skill levels or who are in need of more practice. Peer tutoring is strongly supported by research that shows it improves both the less capable and highly capable students' performance. The instructor must train students to effectively implement their assigned tutorial or teaching roles, provide feedback on the tutors' performance, and assist the peer tutors in solving ongoing instructional challenges.

Inquiry, Discovery, and Problem-Based Strategies

Teaching strategies for inquiry, discovery, and problem-based learning share similar components. They are all based on the idea that the instructor has facilitated student curiosity and interest in an area of study. The curiosity may have been piqued by a field trip to a museum, a book, or a lecture. The strategy involves providing lessons to build students' background knowledge and then providing them with a prompt, such as an interesting question (e.g., How were the pyramids constructed? How could we make cars better?) or an authentic problem (e.g., the aquifer is being reduced at a rate faster than it is being replenished) that encourages exploration, study, and research. Students usually work in groups to investigate their question, collect data, and develop conclusions. The instructor enhances the group process by providing guidance, asking additional questions, directing students to information and resources, and providing social skills support. With less capable students, students with little background knowledge, or those who have not mastered prerequisite knowledge, the instructor may have to provide more guidance, instruction, and assistance at every stage of the project.

New Developments

Although there are many new developments emerging from research on teaching strategies, such as brain studies and culturally responsive teaching, technology has recently had the greatest impact on how instructors teach and students learn. Better and more effective computer software programs designed to facilitate critical thinking, problem solving, and decision making, as well as provide practice on basic skills, are being developed. Projectors in the classroom, the Internet, personal response systems, online learning, blogging, Web-based learning, and electronic portfolios are all affecting instruction and new teaching strategies are being designed using technology applications.

Darcy Miller

See also Brain-Relevant Education;

Cooperative Learning; Direct Instruction;
Discovery Learning; Education; Expert Teachers;
Precision Teaching

Further Readings

- Bruner, J. S. (1996). *The culture of education*. Cambridge, MA: Harvard University Press.
- Dell'Olio, J. M., & Donk, T. (2007). *Models of teaching*. Thousand Oaks, CA: Sage.
- Dewey, J. (1913). *Interest and effort in education*. Cambridge, MA: Houghton-Mifflin.
- Joyce, B. R., Weil, M., & Calhoun, E. (2004). *Models of teaching* (7th ed.). Boston: Allyn & Bacon.
- Mayer, R. E. (2008). *Learning and instruction* (2nd ed.). Upper Saddle River, NJ: Prentice Hall.
- Moore, K. D. (2005). *Effective instructional strategies: From theory to practice*. Thousand Oaks, CA: Sage.
- Morrison, G. R., Ross, S. M., & Kemp, J. E. (2004). *Designing effective instruction* (4th ed.). Hoboken, NJ: Wiley.
- Piaget, J. (1970). *The science of education and the psychology of the child*. New York: Orion.
- Vygotsky, L. S. (1993). *The collected works of L. S. Vygotsky: Vol. 2* (J. Knox & C. Stevens, Trans.). New York: Plenum.
- Woolfolk, A. (2004). *Educational psychology* (9th ed.). Boston: Allyn & Bacon.

Web Sites

- Center for Applied Special Technology (CAST):
<http://www.cast.org>
- National Institute for Direct Instruction:
<http://www.nifdi.org>

TEST ANXIETY

Test anxiety, a worried, restless, agitated distress that results from tests of performance or academic ability, affects everyone: from athletes, to students, to executives. Whether it is triggered by an upcoming speech, an impending athletic competition, a test of curriculum mastery, a college entrance exam, or a critical business decision, test anxiety can either enhance performance or hinder it, depending on whether the triggering event requires physical or intellectual performance. Unlike trait anxiety, which causes worry and distress over an extended period of time, test anxiety is a kind of state anxiety and happens only when one is in a specific situation requiring performance or evaluation. Test anxiety has become of particular concern to educators, students, and parents in the United States since the enactment of No Child Left Behind (NCLB). Internationally, there is heightened concern in recent years over academic testing of toddlers and teens cheating to gain admission into desirable colleges. In the United States, under NCLB regulations, schools face major upheavals if students are not passing standardized tests at the required levels. In what follows, the concept of test anxiety is explained, followed by an overview of test anxiety and the reason for concern within the framework of educational psychology and current standardized testing practices.

Understanding Test Anxiety

Sarason called the mental short-circuiting that results from test anxiety *cognitive interference*. When cognitive interference happens, emotional fear and uneasiness redirect logical, purposeful thought to distractions or sometimes reactions. Most people can recall experiencing the fight-or-flight response to a challenging or threatening situation. When cognitive interference occurs, thinking is replaced with avoidance or illogical choices that an individual would probably not make if he or she were able to think clearly. However, when test anxiety occurs, forethought disappears until the anxiety or fear diminishes. Then, when the anxiety reaction subsides, hindsight follows and the typical individual experiences that “Why did I do that?” remorse.

The emotional overriding of logical thought and memory retrieval has been visually illustrated through